Chapter 3. Data Collection

Basic data collection followed the procedures outlined by Bhowmik et al. (1990) and by Bhowmik and Schicht (1980) and Hagerty (1989). All the data collected and/or measured have been entered in a database.

During 1995, the project principals formed a multi-disciplinary study team to conduct the reconnaissance boat trip with members from the Illinois State Water Survey, the University of Iowa – Iowa Institute of Hydraulic Research, and the U.S. Army Corps of Engineers Rock Island and Huntington Districts. The intent was to conduct a survey by boat and occasional shore expeditions along the Illinois River from Dresden Island Lock and Dam (RM 271.4) to Grafton (RM 0), and along the Mississippi River from St. Paul, Minnesota (RM 830.1) to Cairo, Illinois (RM 0).

Two objectives were accomplished during the boat trips: documenting bank conditions along both sides of the river on navigation charts, and selecting representative sites, collecting data on each site and forming opinions about the causes of erosion at each site. Originally, it was proposed to select and collect data from 20 sites along the Illinois Waterway and 40 sites along the Upper Mississippi River. The total number of sites where field data were collected exceeded these numbers. Moreover, data also were collected from several island sites, and some data were collected from several observation sites.

Boat Trip

This section will describe in general the boat trips that were conducted on the Illinois and Upper Mississippi Rivers. It was not possible to conduct the boat trips in a continuous fashion because of the logistical and personnel needs. Field trip participants included staff and personnel from the Illinois State Water Survey; the U.S. Army Corps of Engineers Rock Island, Huntington, St. Paul, and St. Louis Districts; the University of Iowa — Iowa Institute of Hydraulic Research; and the Illinois Natural History Survey.

Each boat had a team assigned to conduct one or more specific tasks. All the daily activities were planned and coordinated in advance. The daily activity normally started with pre-selecting the potential sites for field data collection based on an evaluation of the aerial photographs and video prior to arriving at the boat docks, checking equipment and supplies, and then starting field work.

Communication among boats was maintained through the use of cellular phones and marine radios. A chase vehicle on the shore provided logistical support throughout the day.

The entire team normally was divided into three or four sub-teams, and each sub-team was assigned a specific task. Sub-team 1 was assigned to the main boat where all the necessary supplies were stored. The main boat was used also as the mapping boat where judgments were made as to the severity of the erosion along both sides of the river, and these judgments were recorded on navigation charts. Sub-team 1 partially was responsible for identifying potential field sites for additional data collection. Sub-team 1 also was responsible for coordinating overall data collection and providing the necessary support on the river.

Sub-team 2 was responsible for locating the latitude and longitude of each site by using a Global Positioning System. This team also measured the river cross section at the midsection of the selected site. Occasionally, cross sections of the channel, including eroding banks, were measured at the upstream and downstream ends of the site.

Sub-teams 3 and 4 were responsible for surveying at least three bank sections at each selected site. Bank section measurements were taken near the upstream and downstream ends of the reach and at the midsection. The team was responsible also for collecting bank soil samples, which included core samples and sediment samples from the river within wading depths. These two teams took shore-based photographs of the sites. A geomorphologist also worked on the Upper Mississippi River as part of the team.

All of the boat trips on the Illinois Waterway and the Upper Mississippi River were coordinated with the waterway operation personnel of the U.S. Army Corps of Engineers. Figures 3-1 and 3-2 are photographs depicting the field data collection activities.

Trip on the Illinois Waterway (IWW)

The study team completed the Illinois River survey on two different trips. From August 24-31, 1995, the team completed reconnaissance and site surveys from Ottawa (RM 240) to Grafton, Illinois (RM 0). From September 18-20, 1995, the team completed the remaining upper section from downstream of Brandon Road Lock and Dam (RM 282.5) to Ottawa (RM 240).

Figure 3-1. Field data collection on the Illinois Waterway

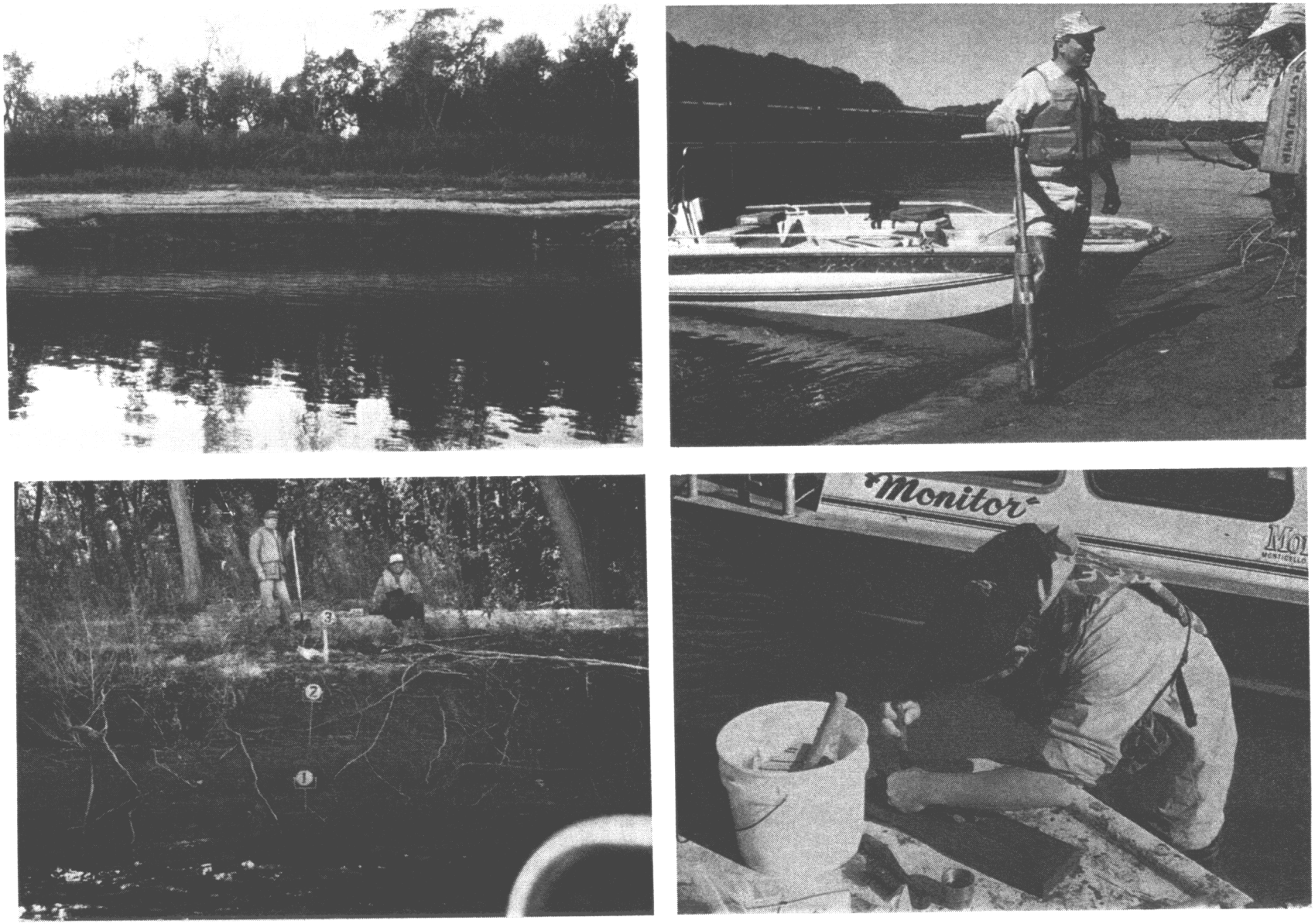

Figure 3-2. Field data collection on the Upper Mississippi River

The trip from August 24-31, 1995, was the first reconnaissance boat trip for the team. As planned, the team divided into four groups, each traveling by boat, to conduct the survey. A 36-foot field boat the *Richardson*, owned by the State of Illinois, was the home base for the study team. This boat was used to map bank conditions, store camp supplies and miscellaneous equipment, and provide shelter during inclement weather. Normally, the *Richardson* moved slowly and kept moving while other faster boats collected data from specific sites, and then caught up with the *Richardson*.

The second trip on the Illinois Waterway was completed September 18-20, 1995, when the field crew traveled from Brandon Road Lock and Dam (RM 286) to Ottawa (RM 240). During these two trips, 29 sites were selected and these sites were located on the Illinois Waterway Navigation Chart shown in figure 3-3. Table 3-1 provides the dates when these sites were selected and their locations.

Trip on the Upper Mississippi River (UMR)

The trip on the UMR was completed in three sections: from RM 838, St. Paul, Minnesota, to RM 484, Rock Island, Illinois (September 11-18, 1995); from Rock Island to Louisiana, Missouri, RM 283 (October 2-6, 1995); and from Louisiana to Cairo, Illinois, RM 0 (from October 12-17, 1995). During these trips a total of 43 sites were selected, as shown in figure 3-4. Table 3-2 shows the dates when these sites were selected and gives their locations.

Site Selection

One primary goal for the boat trip was to collect detailed information from representative sites for further testing and evaluation. A total of 29 sites on the Illinois River and 43 sites on the Mississippi River were selected for the detailed data collection and analysis. Information available to the team members selecting representative sites included an aerial oblique videotape, photographs, and information from the operation and maintenance personnel from the Corps of Engineers. Corps of Engineers personnel from the Huntington District reviewed all the videotape and aerial photographs and tentatively selected sites for detailed data collection from both rivers. This information and the input from the Operation and Maintenance personnel of the Corps of Engineers guided the selection of the sites before the field trip was initiated.

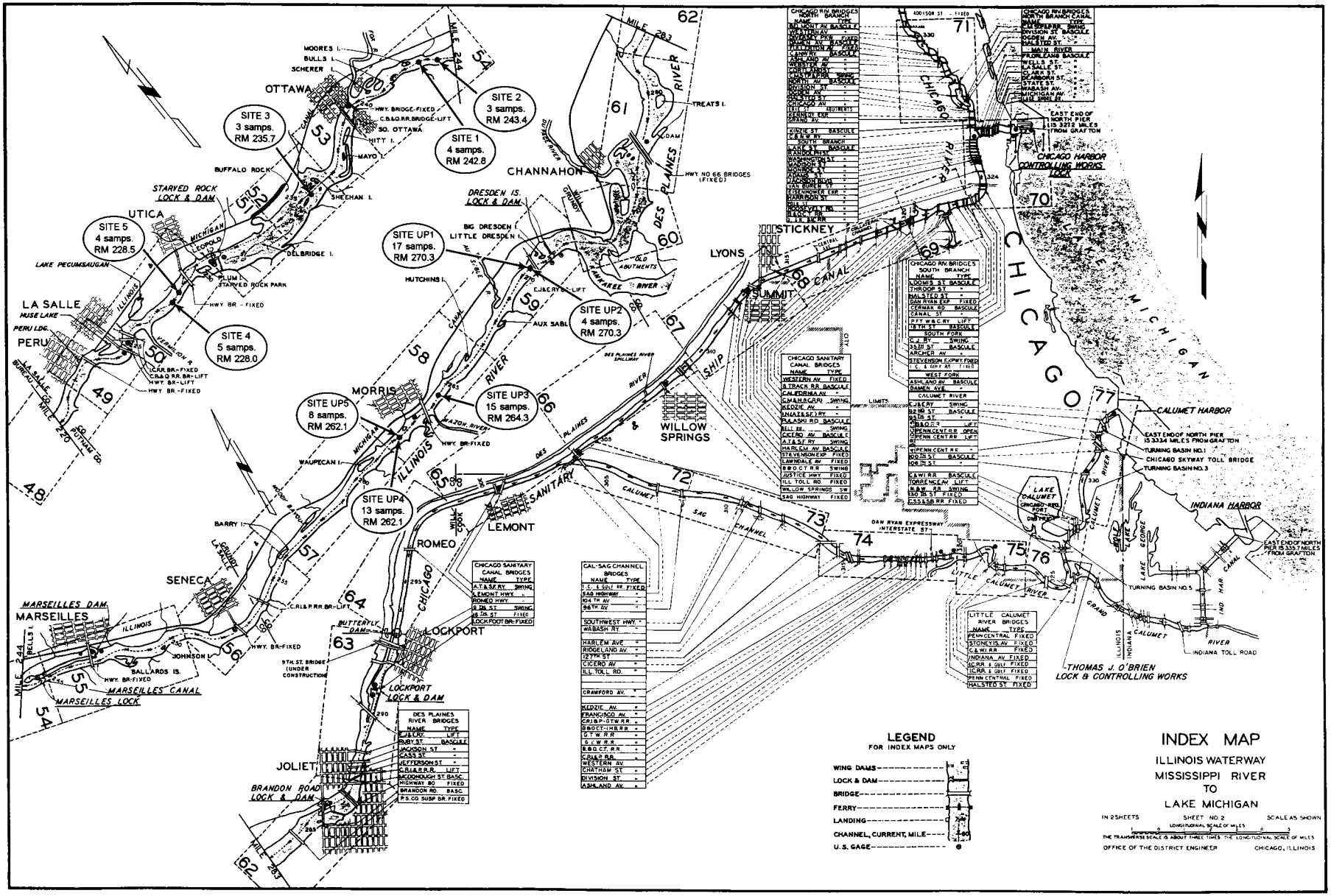

Figure 3-3. Location of field sites on the Illinois River

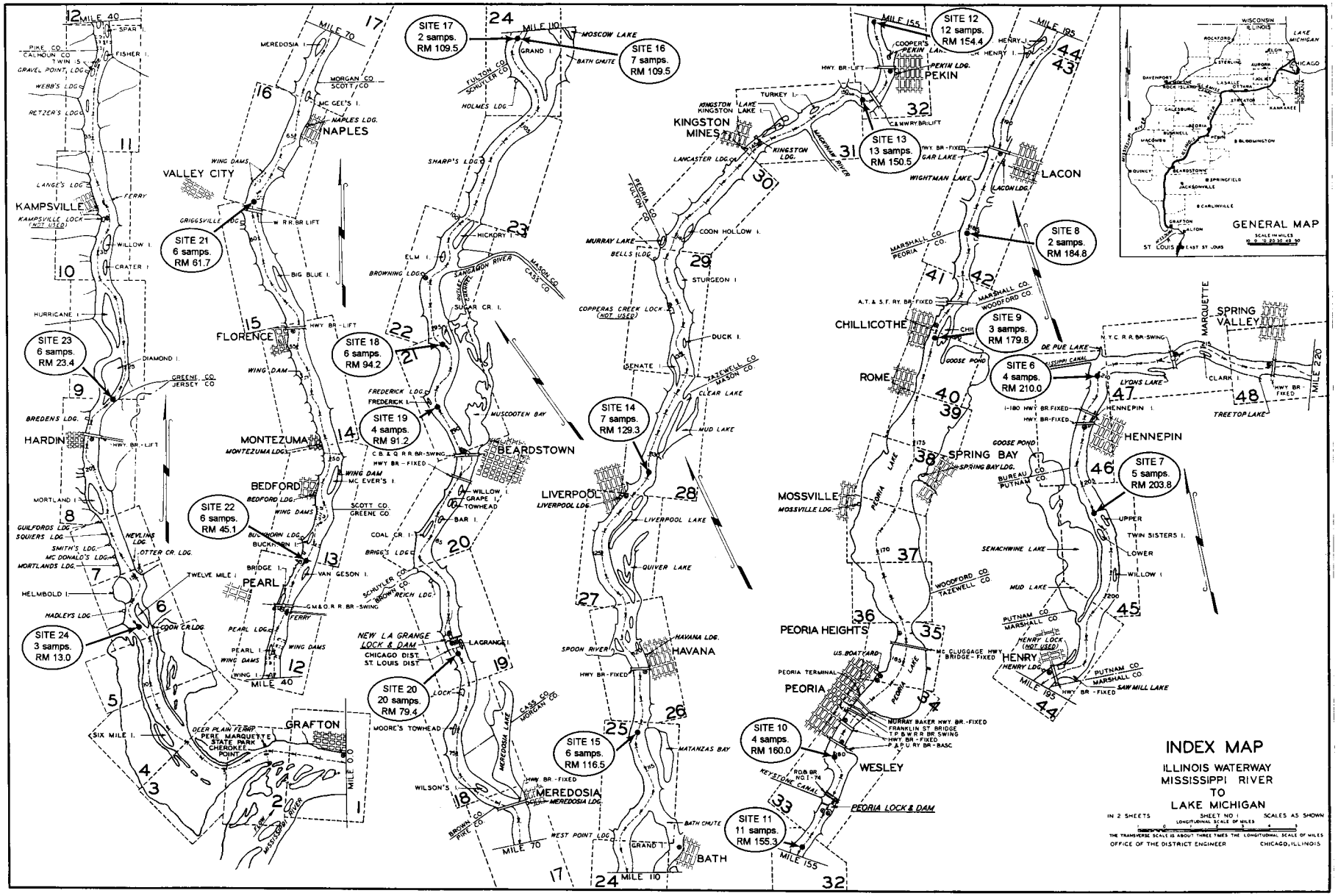

Figure 3-3. Concluded

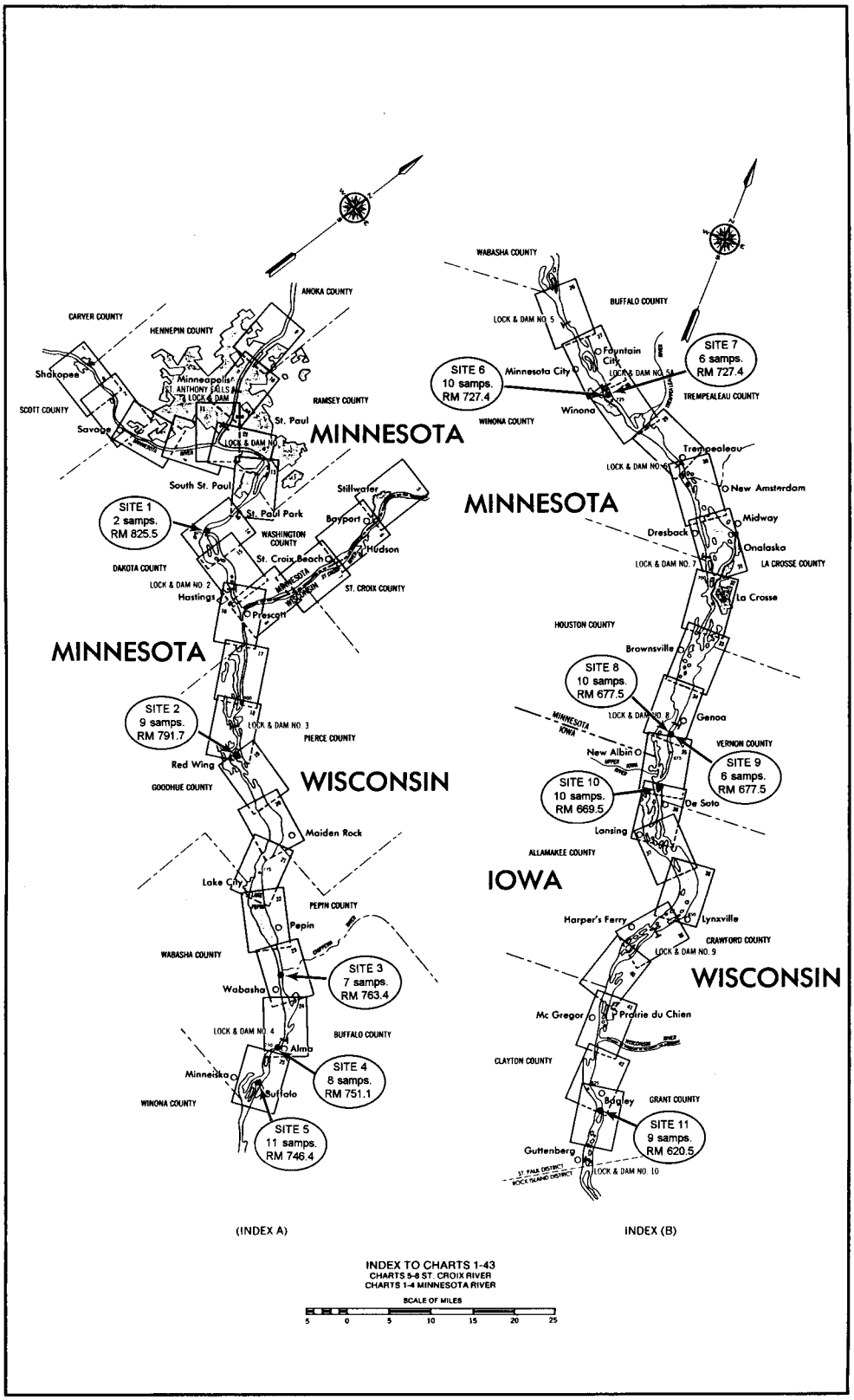

Figure 3-4. Location of field sites on the Upper Mississippi River

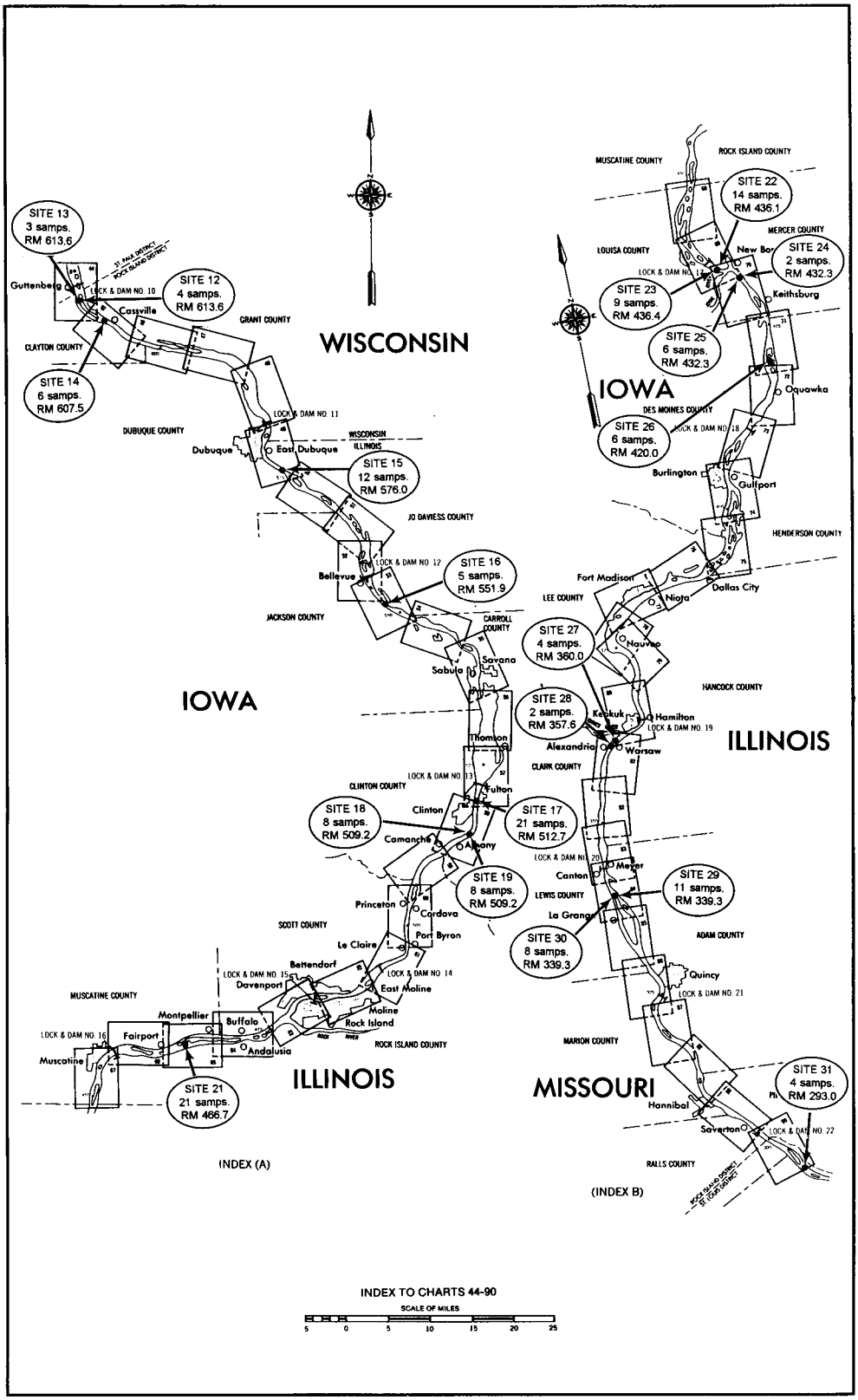

Figure 3-4. Continued

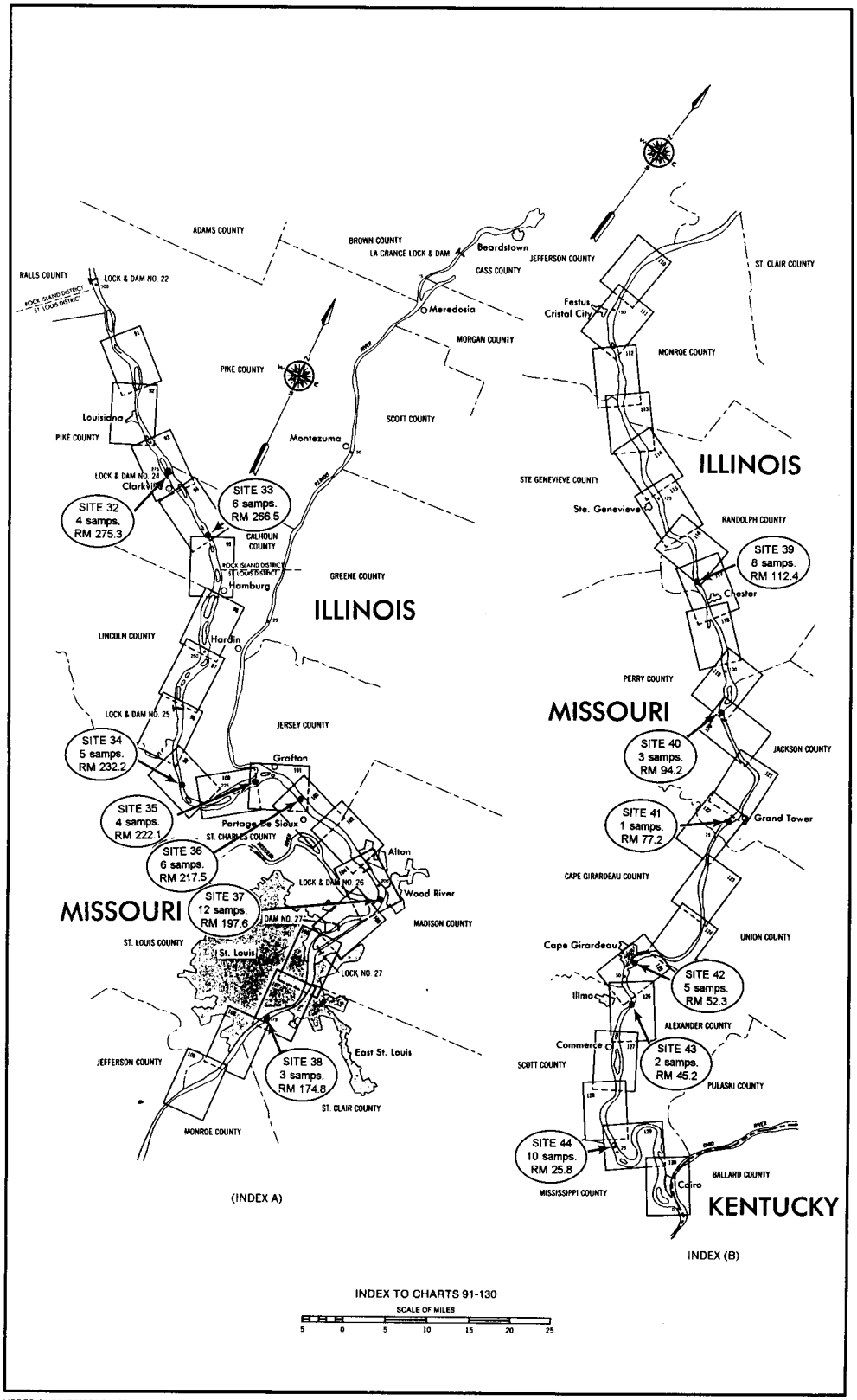

Figure 3-4. Concluded